Application No. 10/607,751
Amendment Dated December 28, 2004
Reply to Office Action of September 3, 2004

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A process for determining a magnitude of a noise of an electronic object to be measured, said process comprising:

inputting ~~a~~an unmodulated sine signal (S_{in}) into the electronic object; and

measuring an associated power level with a level meter, wherein the level meter determines a sine power level $(\hat{P}_{sin})$ and a noise power level $(\hat{P}_{noise})$ separately.

2. (Previously presented) The process of claim 1, wherein the level meter takes samples of output signals (S_{out}) and determines a sample value from the sine power level, $(\hat{P}_{sin})$ by taking an arithmetical average of the samples and subsequent squaring of an amount of an arithmetical average of the samples.

3. (Previously presented) The process of claim 2, wherein the noise power level is obtained by taking an arithmetical average of the amount squared of the samples and subsequent subtraction of the sine power level $(\hat{P}_{sin})$.

4. (Previously presented) The process of claim 2, wherein prior to taking the average value, an estimation and a revision of a deviation of a frequency of the input sine signal (S_{in}) from a frequency of an available local oscillator in the level meter are carried out.

5. (Previously presented) The process of claim 1, wherein the magnitude of the noise is the noise temperature T_{DUT} of the object to be measured, and the noise temperature T_{DUT} is determined by the formula:

$$T_{DUT} = \frac{P_{sin}}{k \cdot B_M} \cdot \frac{P_{MESS,noise}}{P_{MESS,sin}}$$

where

P_{sin}	is the power level of the sine signal at the input of the object to be measured
$P_{MESS,sin}$	is the sine power level measured with the level meter
$P_{MESS,noise}$	is the noise power level measured with the level meter
k	is the Boltzmann Constant, and
B_M	is a bandwidth of the level meter .

6. (Previously presented) The process of claim 1, wherein: (a) a calibration precedes the measurement, in which the sine signal (S_{in}) has a level identical to a measurement level; (b) the sine signal is input directly into the level meter circuitously by-passing the object to be measured; (c) the magnitude of the noise is the noise temperature T_{DUT}; and the noise temperature T_{DUT} of the object to be measured is determined by the formula:

$$T_{DUT} = \frac{P_{sin}}{k \cdot B_M} \cdot \frac{(P_{MESS,noise} - P_{CAL,noise})}{P_{MESS,sin}}$$

wherein

P_{sin}	is the power level of the sine signal at the input to the object to be measured,
$P_{MESS,sin}$	is the power level of the sine measured with intermediate circuitous inclusion of the object to be measured and measured with the level meter
$P_{MESS,Noise}$	is the power level of the noise measured with intermediate circuitous inclusion of the object to be measured measured with the level meter
$P_{CAL,noise}$	is the power level of the noise measured without intermediate circuitous inclusion of the object to be measured measured with the level meter
k	is the Boltzmann Constant
B_M	is the bandwidth of the level meter.

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7. (Currently Amended) An apparatus for determining a magnitude of a noise of an electronic object to be measured, said apparatus comprising:

a sine-signal source adapted to produce ~~a~~an unmodulated sine signal which is to be input into the object to be measured;

a level meter for measuring a power level at an output of the object to be measured, wherein the level meter is equipped with a sine power level detector device for separately and discretely capturing a sine power level $\hat{P}_{sin}$ and a noise power level detector device for capturing a noise power level $(\hat{P}_{noise})$.

8. (Previously Amended) The apparatus of claim 7, wherein the level meter captures samples of an output signal at the object to be measured and the sine power level detector device determines the sine-power level $\hat{P}_{sin}$ by taking an arithmetical average of the samples and subsequent squaring of an amount of an arithmetic average value of the samples.

9. (Previously Amended) The apparatus of claim 8, wherein the noise power level detector device determines the noise power level $(\hat{P}_{noise})$ by taking an arithmetical average of a square of an amount of a sample and subsequent subtraction of the sine power level $\hat{P}_{sin}$.

10. (Previously Amended) The apparatus of claim 8, wherein the level meter has a frequency estimation device which, prior to taking the average undertakes an estimation of a frequency deviation between the frequency of the sine signal input into the object to be measured, a frequency of a local oscillator present in the level meter, and a frequency correction device, which rectifies the said frequency deviation.

11. (Previously Amended) The apparatus of claim 7, wherein the magnitude of the noise is the noise temperature T_{DUT}, and an evaluator is adapted to determine the noise temperature T_{DUT} of the object to be measured using the formula:

$$T_{DUT} = \frac{P_{sin}}{k \cdot B_M} \cdot \frac{(P_{MESS,noise})}{P_{MESS,sin}}$$

wherein:

$P_{(sin)}$ is the power level of the sine signal at the

input of the object to be measured,

$P_{(MESS,sin)}$	is the sine power level as measured with the level meter,
$P_{MESS,noise}$	is the noise power level as measured with the level meter,
k	is the Boltzmann Constant, and
B_M	is a bandwidth of the level meter.

12. (Currently Amended) The apparatus of claim 7, wherein (a) a calibration precedes the measurement, in the case of which the sine signal ~~$P_{(sin)}$~~ is input directly into the level meter at a level identical to a measurement level determined by the measurement without an intermediate routing through the object to be measured; (b) the magnitude of the noise is the noise temperature T_{DUT}; and (c) an evaluation device determines the noise temperature T_{DUT} of the object to be measured in accord with the formula:

$$T_{DUT} = \frac{P_{sin}}{k \cdot B_M} \cdot \frac{(P_{MESS,noise} - P_{CAL,noise})}{P_{MESS,sin}}$$

wherein:

P_{sin}	is the power level of the sine signal at the input of the object to be measured,
$P_{MESS,sin}$	is the sine power level with circuitous inclusion of the object to be measured as measured with the level meter,
$P_{MESS,noise}$	is the noise power level with circuitous inclusion of the object to be measured, as measured with the level meter,
$P_{CAL,noise}$	is the noise power level without circuitous inclusion of the object to be measured, as measured with the level meter,
k	is the Boltzmann Constant, and
B_M	is a bandwidth of the level meter.

13. (New) A process for determining a magnitude of a noise of an electronic object to be measured, said process comprising:

inputting a sine signal (S_{in}) into the electronic object; and

measuring an associated power level with a level meter, wherein an estimation and a revision of a deviation of a frequency of the input sine signal (S_{in}) from a frequency of an available local oscillator in the level meter are carried out.

14. (New) The process of claim 13, wherein the level meter determines a sine power level ($\hat{P}_{sin}$) and a noise power level ($\hat{P}_{noise}$) separately.

15. (New) The process of claim 13, wherein the level meter takes samples of output signals (S_{out}) and determines a sample value from the sine power level, ($\hat{P}_{sin}$) by taking an arithmetical average of the samples and subsequent squaring of an amount of an arithmetical average of the samples.

16. (New) The process of claim 15, wherein the noise power level is obtained by taking an arithmetical average of the amount squared of the samples and subsequent subtraction of the sine power level ($\hat{P}_{sin}$).

17. (New) The process of claim 13, wherein the magnitude of the noise is the noise temperature T_{DUT} of the object to be measured, and the noise temperature T_{DUT} is determined by the formula:

$$T_{DUT} = \frac{P_{sin}}{k \cdot B_M} \cdot \frac{P_{MESS,noise}}{P_{MESS,sin}}$$

where

P_{sin}	is the power level of the sine signal at the input of the object to be measured
$P_{MESS,sin}$	is the sine power level measured with the level meter
$P_{MESS,noise}$	is the noise power level measured with the level meter

k	is the Boltzmann Constant, and
B_M	is a bandwidth of the level meter .

18. (New) The process of claim 13, wherein: (a) a calibration precedes the measurement, in which the sine signal (S_{in}) has a level identical to a measurement level; (b) the sine signal is input directly into the level meter circuitously by-passing the object to be measured; (c) the magnitude of the noise is the noise temperature T_{DUT}; and the noise temperature T_{DUT} of the object to be measured is determined by the formula:

$$T_{DUT} = \frac{P_{sin}}{k \cdot B_M} \cdot \frac{(P_{MESS,noise} - P_{CAL,noise})}{P_{MESS,sin}}$$

wherein

P_{sin}	is the power level of the sine signal at the input to the object to be measured,
$P_{MESS,sin}$	is the power level of the sine measured with intermediate circuitous inclusion of the object to be measured and measured with the level meter
$P_{MESS,Noise}$	is the power level of the noise measured with intermediate circuitous inclusion of the object to be measured measured with the level meter
$P_{CAL,noise}$	is the power level of the noise measured without intermediate circuitous inclusion of the object to be measured measured with the level meter
k	is the Boltzmann Constant
B_M	is the bandwidth of the level meter.

19. (New) An apparatus for determining a magnitude of a noise of an electronic object to be measured, said apparatus comprising:

a sine-signal source adapted to produce a sine signal which is to be input into the object to be measured;

a level meter for measuring a power level at an output of the object to be measured, wherein the level meter is equipped with

a sine power level detector device for separately and discretely capturing a sine power level $\hat{P}_{sin}$,

a noise power level detector device for capturing a noise power level $(\hat{P}_{noise})$,

a frequency estimation device which, prior to taking the average undertakes an estimation of a frequency deviation between the frequency of the sine signal input into the object to be measured and a frequency of a local oscillator present in the level meter, and

a frequency correction device, which rectifies the frequency deviation.

20. (New) The apparatus of claim 19, wherein the level meter captures samples of an output signal at the object to be measured and the sine power level detector device determines the sine-power level $\hat{P}_{sin}$ by taking an arithmetical average of the samples and subsequent squaring of an amount of an arithmetic average value of the samples.

21. (New) The apparatus of claim 20, wherein the noise power level detector device determines the noise power level $(\hat{P}_{noise})$ by taking an arithmetical average of a square of an amount of a sample and subsequent subtraction of the sine power level $\hat{P}_{sin}$.

22. (New) The apparatus of claim 19, wherein the magnitude of the noise is the noise temperature T_{DUT}, and an evaluator is adapted to determine the noise temperature T_{DUT} of the object to be measured using the formula:

$$T_{DUT} = \frac{P_{sin}}{k \cdot B_M} \cdot \frac{(P_{MESS,noise})}{P_{MESS,sin}}$$

wherein:

$P_{(sin)}$	is the power level of the sine signal at the input of the object to be measured,
$P_{(MESS,sin)}$	is the sine power level as measured with the level meter,
$P_{MESS,noise}$	is the noise power level as measured with the level meter,

k	is the Boltzmann Constant, and
B_M	is a bandwidth of the level meter.

23. (New) The apparatus of claim 7, wherein (a) a calibration precedes the measurement, in the case of which the sine signal is input directly into the level meter at a level identical to a measurement level determined by the measurement without an intermediate routing through the object to be measured; (b) the magnitude of the noise is the noise temperature T_{DUT}; and (c) an evaluation device determines the noise temperature T_{DUT} of the object to be measured in accord with the formula:

$$T_{DUT} = \frac{P_{sin}}{k \cdot B_M} \cdot \frac{(P_{MESS,noise} - P_{CAL,noise})}{P_{MESS,sin}}$$

wherein:

P_{sin}	is the power level of the sine signal at the input of the object to be measured,
$P_{MESS,sin}$	is the sine power level with circuitous inclusion of the object to be measured as measured with the level meter,
$P_{MESS,noise}$	is the noise power level with circuitous inclusion of the object to be measured, as measured with the level meter,
$P_{CAL,noise}$	is the noise power level without circuitous inclusion of the object to be measured, as measured with the level meter,
k	is the Boltzmann Constant, and
B_M	is a bandwidth of the level meter.